

Claims

We claim:

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1. A *Borellia burgdorferi* epitope polypeptide with an amino acid sequence selected from the group consisting of:
5 VQEGVQOEGAQQP-(beta-A) (beta-,4)C; EIAAKAIGKKIHQNNG-(beta-A) (beta-A)C; ISTLIKQKLDGLKNE-(beta-A) (beta-A)C; PWAESPKKPE-(beta-A) (beta-A)C; DKKAINLDKAQQKLD-(beta-A) (beta-A)C; ITKGKSQKSLGL-(beta-A) (beta-A)C; and GMTFRAQEGAFLTG-(beta-A) (beta-A)C.
 - 10 2. The composition of matter of claim 1, wherein said epitope polypeptide **comprises** VQEGVQOEGAQQP-(beta-A) (beta-,4)C.
 3. The composition of matter of claim 2, wherein said epitope polypeptide **consists essentially of** VQEGVQOEGAQQP-(beta-A) (beta-,4)C.
 - 15 4. The composition of matter of claim 1, wherein said epitope polypeptide comprises EIAAKAIGKKIHQNNG-(beta-A) (beta-A)C.
 5. The composition of matter of claim 4, wherein said epitope polypeptide consists essentially of EIAAKAIGKKIHQNNG-(beta-A) (beta-A)C.
 - 20 6. The composition of matter of claim 1, wherein said epitope polypeptide comprises ISTLIKQKLDGLKNE-(beta-A) (beta-A)C.
 7. The composition of matter of claim 6, wherein said epitope polypeptide consists essentially of ISTLIKQKLDGLKNE-(beta-A) (beta-A)C.
 - 25 8. The composition of matter of claim 1, wherein said epitope polypeptide comprises PWAESPKKPE-(beta-A) (beta-A)C.
 9. The composition of matter of claim 8, wherein said epitope polypeptide consists essentially of PWAESPKKPE-(beta-A) (beta-A)C.
 - 30 10. The composition of matter of claim 1, wherein said epitope polypeptide comprises DKKAINLDKAQQKLD-(beta-A) (beta-A)C.
 11. The composition of matter of claim 10, wherein said epitope polypeptide consists essentially of DKKAINLDKAQQKLD-(beta-A) (beta-A)C.
 - 35 12. The composition of matter of claim 1, wherein said epitope

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27. The vaccine of claim 16, wherein said epitope polypeptide comprises ITKGKSQKSLGD-(beta-A)(beta-A)C.

29. The vaccine of claim 28, wherein said epitope polypeptide comprises GMTFRAOEGAFITG-(beta-A)(beta-A)C.

30. The vaccine of claim 29, wherein said epitope polypeptide
10 consists essentially of GMTFRAQEGAFITG-(beta-A) (beta-A)C.

31. The nucleic acid sequence coding for a *Borellia burgdorferi* epitope polypeptide with an amino acid sequence selected from the group consisting of: VQEGVQQEGAQQP-(beta-A) (beta-,4)C; EIAAKAIGKKIHQNNG-(beta-A) (beta-A)C; ISTLIKQKLDGDKNE-(beta-A) (beta-A)C; PWAESPKKPE-(beta-A) (beta-A)C; DKKAINLDKAQQKLD-(beta-A) (beta-A)C; ITKGKSQKSLGD-(beta-A) (beta-A)C; and GMTFRAQEGAFITG-(beta-A) (beta-A)C.

32. The composition of matter of claim 31, wherein said
20 epitope polypeptide comprises VQEGVQOEGAQQP-(beta-A)(beta-,4)C.

33. The composition of matter of claim 32, wherein said epitope polypeptide consists essentially of VQEGVQQEGAQQP-(beta-A) (beta=, 4)C.

34. The composition of matter of claim 31, wherein said
25 epitope polypeptide comprises EIAAKAIGKKIHQ₂NNG-(beta-A)(beta-
A)C.

35. The composition of matter of claim 34, wherein said epitope polypeptide consists essentially of EIAAKAIGKKIHQNG-(beta-A) (beta-A)C.

30 36. The composition of matter of claim 31, wherein said
epitope polypeptide comprises ISTLIKQKLDGLKNE-(beta-A)(beta-A)C.

37. The composition of matter of claim 36, wherein said epitope polypeptide consists essentially of ISTLIKQKLDGLKNE-(beta-A)(beta-A)C.

35 38. The composition of matter of claim 31, wherein said
epitope polypeptide comprises PWAESPKKPE-(beta-A)(beta-A)C.

40. The composition of matter of claim 31, wherein said
5 epitope polypeptide comprises DKKAINLDKAQQKLD-(beta-A)(beta-A)C.

42. The composition of matter of claim 31, wherein said
10 epitope polypeptide comprises ITKGKSQKSLGD-(beta-A)(beta-A)C.

44. The composition of matter of claim 31, wherein said
15 epitope polypeptide comprises GMTFRAQEGAFITG-(beta-A)(beta-A)C.

45. The composition of matter of claim 44, wherein said epitope polypeptide consists essentially of GMTFRAQEGAFLTG-(beta-A)(beta-A)C.